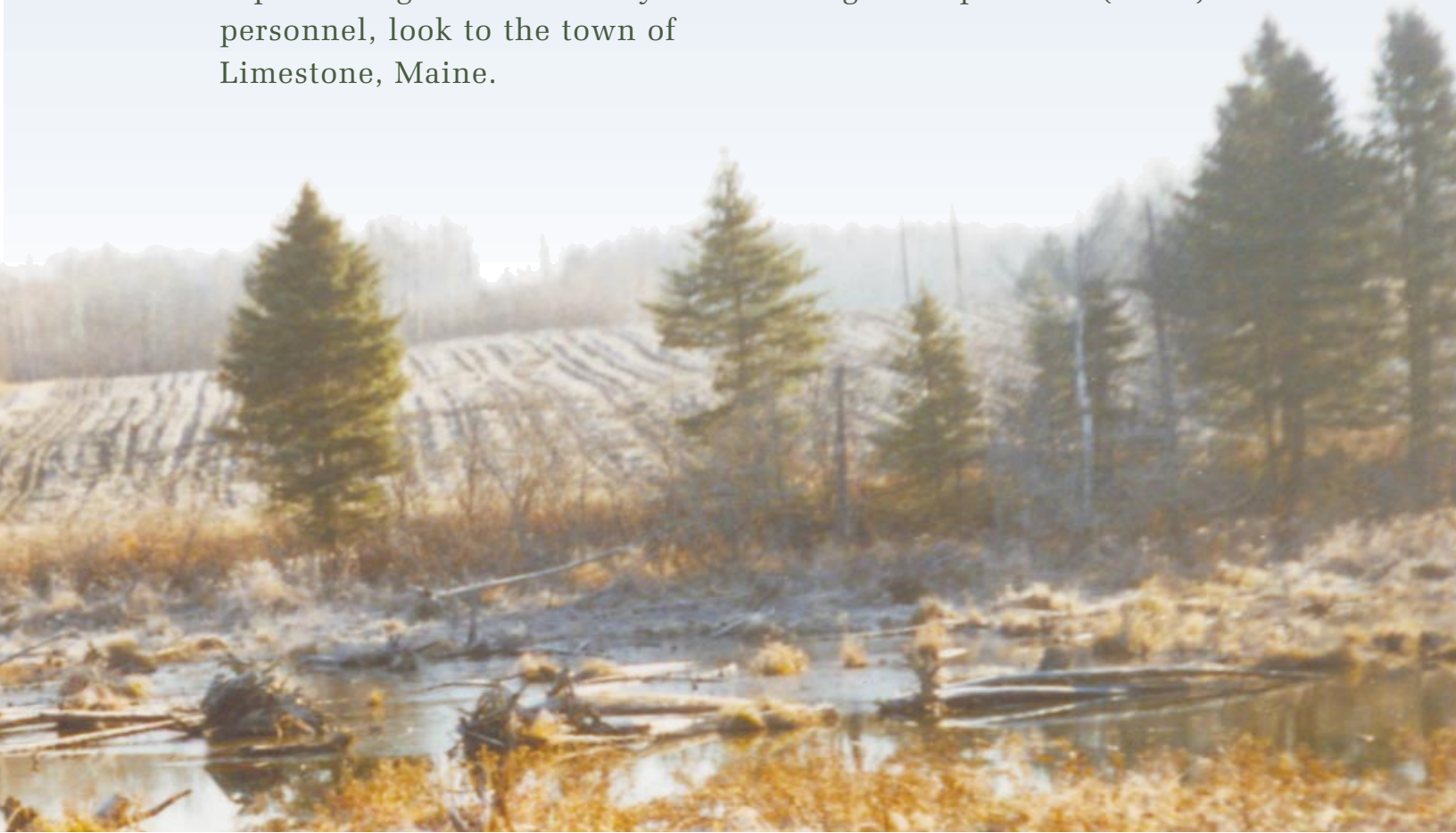
Silver Spring Brook

WATERSHED DEMONSTRATION PROJECT

WATER QUALITY IMPROVEMENT THROUGH COOPERATION

If you're searching for an example of how to obtain cooperation from landowners whose fields and access roads are degrading a body of water with nonpoint source pollution, look to the town of Limestone, Maine. If you're struggling with a project that was successful despite experiencing turnover in key personnel, look to the town of Limestone, Maine.

Limestone's Silver Spring Brook Watershed Demonstration Project proved that good communication of accurate information, coupled with a community's determination and team work, can lead to successful completion of a very important water quality improvement project using best management practices (BMPs).



The Problem

The Silver Spring Brook watershed encompasses approximately 1,400 acres, 42% of which is cropland. The remaining acreage is either forested or in the Conservation Reserve Program. Over the years, the stream's water quality was degraded to the point of being almost unusable. Field roads, ditches, stream crossings and sections of some fields were identified as significant contributors to the stream's degradation.

Silver Spring Brook had threefold value to the town of Limestone:

- The town's drinking water supply
- A cold-water habitat for native brook trout
- The feeder for the community swimming pond.

TOP—During spring thaw and heavy rains, culverts could not handle the volume of runoff, which would spill over onto the roadway, adding sediment and debris to Limestone's water supply;
BOTTOM—Highly erodible farmland also contributed to the degradation of the water.

Silver Spring Brook Watershed Reservoir was vulnerable to uncontrolled runoff.

The local brook trout population was adversely affected by sedimentation of their habitat.

All of these uses were in jeopardy.

Drinking Water

The Limestone Water & Sewer District was working under the prospect of monthly fines from the Maine Department of Human Services if they didn't improve turbidity readings of the town's treated drinking water supply. The fragile and vulnerable nature of the spring's ecosystem was evidenced by the fact that one rainy day could increase raw turbidity readings eight times or more. Raw turbidity readings could range from .69 NTUs (drinking water standard) to 5.5 NTUs in a 24-hour period.

When raw turbidity readings were high, the District's treatment facility was unable to achieve the new federal drinking water standard of .50 NTU treated turbidity. The standard is to ensure good kill of pathogens: viruses, etc. Without that level, the town could not guarantee safe drinking water. "After a good rain," explained District Superintendent Gary Fitzsimmons, "that water was as brown as a cup of coffee and full of sediment. It was impossible to filter and treat it down to the .50 standard."

Native Brook Trout

Silver Spring Brook once was a healthy cold-water habitat for native brook trout because of its exceptional water quality. The degradation of the water quality was now a threat to that habitat. Sediment had filled in pools where trout congregated on warm summer days, and had covered the gravel spawning areas.

Community Swimming Pond

While the brook and its holding pond are not themselves swimming spots, they feed the community swimming pond. As such, murky brook water endangered the town's recreational swimming area. Since this is the only swimming area available in the community, maintaining good water quality is essential.

Additional culverts were installed at the lowest point of a farm access road to handle the water volume.

This farm access road was graded and crowned to improve drainage and prevent erosion.

The Players— A Cooperative Venture

Efforts to restore water quality of the Silver Spring Brook were noteworthy because of the number of people and agencies involved in a high-profile cooperative venture.

The town of Limestone formed a partnership with the Central Aroostook Soil & Water Conservation District (SWCD) to plan and implement an NPS (non-point source) 319 Grant from the EPA (Environmental Protection Agency). The EPA funds were funneled through the MDEP (Maine Department of Environmental Protection) for administrative purposes. Additionally, the USDA (U.S. Department of Agriculture), NRCS (Natural Resources Conservation Service) and MDEP consulted on how best to solve the problem.

A key component to the project's success was cooperation from adjacent landowners, all of whom are farmers. Paul Beaulieu, who became town manager after the project was under way, and SWCD's Ken Hill, who stepped in when the project's original planner, Steve Towle, left the area, had a meeting with the farmers to explain what needed to be done.

"Many of the farmers were reluctant at first," explained Beaulieu, "because they thought their land would be taken from them with no compensation. Ken explained the various options and offered them some flexibility."

This project is a perfect example of what can be accomplished to everyone's benefit when all parties cooperate. —Kathy Hoppe, Maine DEP

The Result

- Several acres of highly erodible cropland were placed in conservation reserve.
- Diversion ditches were constructed to divert the flow of water away from the brook.
- Turnouts were built to divert road flow into the woods.
- Culverts were replaced and new ones added to allow unimpeded stream flow.
- Rip rap was installed around the culverts.
- A sediment pond was constructed to collect runoff from cropland.
- Drain tile was installed to control the water from a natural spring that had been causing erosion and deterioration of a farm access road.
- The farm access road that crossed the stream was graded and crowned.
- The stream crossing was repaired and stabilized.
- Existing road ditches were reshaped and stabilized and new ditches were constructed.
- Grass buffers were established along fields.

Ken Hill, whose success is partly due to his credibility with the farmers, listened to them. "Without exception, they were willing to do what needed to be done to help their own community," Hill observed. "They didn't see this as someone else's problem."

Glenn Beaulieu's farm borders the brook and is the farm on which most of the BMPs were constructed: diversion ditches, culverts, road crowning and grading. Glenn also put four acres of farmland into the Conservation Reserve Program (CRP). "I couldn't cultivate that acreage during wet years," he explained, "and I was losing a lot of topsoil. I was happy to place that land in CRP."

Glenn says that since the BMPs were installed, there have not been any washes, the diversion ditches are working, and the water looks much cleaner.

Kathy Hoppe, MDEP's non-point source grant project manager, served as guide and cheerleader throughout the entire grant writing and project implementation process. She was very impressed with the level of cooperation shown by everyone.

"This project is a perfect example of what can be accomplished to everyone's benefit when all parties cooperate," she stated. "The town of Limestone did something I've never seen done before: stepped up to the plate and partnered with anyone who could help accomplish the project objectives. It was impressive."

Town Involvement

The town of Limestone went even further. To help save money, they used crew and equipment from the town's public works department for all the earth work. They did all the excavation work, the turnouts, ditches, grading and crowning, water bars, culverts, tile basin, stream crossing repair and buffer strip seeding.

"C.P. Harris from the Limestone Development Foundation got me involved," explained Public Works Director Dale Brooker. "We were able to do the work cheaper than a private contractor, and our work was a good portion of the town's share of matching funds for the grant."

Representatives from surrounding communities were invited to view the completed project.

Brooker said their biggest challenge was getting the work done before the wet season, which they were able to do. In fact, they even had grass coming up before the wet season.

"Another reason for using the public works department," explained C.P. Harris, project director, "is so they'll be better prepared to maintain the work they've done. The natural ditches and turnouts will need to be monitored and upgraded from time to time, and the sediment pond will probably need to be cleaned once a year."

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—Dale Brooker, Limestone Public Works Director

The End Result

The Silver Spring Brook Watershed Demonstration Project was successful on all counts.

Drinking Water Supply

Raw water turbidity readings for the third quarters of 1995 and 1996 (before improvements) averaged 1.99 NTUs, and the average number of days over 1.6 NTUs (drinking water standard) was 8.3 NTU days per month.

Raw water turbidity readings for the same period in 1997 and 1998 averaged 1.225 NTUs and the average number of days per month that the drinking water standard was exceeded was 3.5 NTU days per month. This 38% improvement was experienced prior to all the BMPs were fully established, so additional improvement is realistically expected.

Native Brook Trout Habitat

Decreasing and, in some cases, eliminating the murky conditions immediately improved the native brook trout habitat.

Community Swimming Pond

Lower turbidity readings also result in improved swimming conditions for the community.

Conclusion

The Silver Spring Brook Watershed Demonstration Project clearly illustrates what can be accomplished when diverse people put aside their differences and personal interests in deference to the common good. This proves the importance of effective and honest communication with those vested in a project. It also demonstrates how effectively various governmental agencies can work together to help realize a project's objectives.

The results of the BMPs established at Silver Spring Brook prove that we can prevent degradation of our waterways and, in fact, can improve water quality.

The Silver Spring Brook Watershed Demonstration Project teaches us two important lessons:

- Many seemingly inconsequential unstable land use practices can add up to water quality degradation.
- However, through commitment of local people and agencies, and effective team work, water pollution can be prevented and water quality restored.

The chief inspector gives her final seal of approval.

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